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The impact of siblings during talent development: a longitudinal examination in sport.

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Abstract

Recent studies have begun to explore the potentially positive impact of siblings on sporting talent development. This study aimed to explore potential mechanisms through which siblings impact on this process. Bi-monthly interviews were conducted with four families over a 1 year period (parents and siblings; $N = 14$) during the talent development process. Findings revealed several themes (regularity of interaction, emotional interpersonal skills, rivalry, resilience, and separation) aligning with previous studies, alongside two new themes; communication and skill development. The study's longitudinal nature exposed important differences of potential mechanisms across families, highlighting the complex nature of the sibling relationship.

Key words: biopsychosocial, case study, family systems theory, sport, soccer.

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With the sibling relationship portrayed as the most pervasive and longest lasting across the lifespan (Conger & Kramer, 2010), recognition of the prominent role that siblings can provide during an individual's development is unsurprising (Furman & Buhrmester, 1985). As Howe and Recchia (2014, p. 4) outline, "the sibling relationship is a natural laboratory for young children to learn about their world" and, therefore, must be seen as an important context for individualized growth (Volling, 2003). Indeed, studies have shown that siblings can directly influence development by acting as social partners, role models, and foils (McHale, Updegraff, & Whiteman, 2012). Within sport, such a pervasive presence has led to findings that highlight the positive impact siblings can have on athletic development (Taylor, Collins, & Carson, 2017). As such, although research has more frequently focused on the parent–athlete and/or coach–athlete relationship (e.g., Jowett & Timson-Katchis, 2005), these more recent findings suggest the need for an equal depth of future investigation within the talent development (TD) environment. Notably, however, recent research examining the sibling relationship within the TD environment has been limited by its retrospective nature, leading to calls for further investigation on a longitudinal basis (e.g., Taylor et al., 2017). Accordingly, this paper focuses on tracking the long-term relationships of siblings in sport.

Given our focus on intra-family interactions, it was appropriate to situate the work in a suitable and well-established paradigm. Family systems theory (FST; Minuchin, 1974) recognizes individual relationships within the family system as representing unique subsystems (e.g., athlete–athlete, parent–athlete). Examining the subsystems formed by an athlete and their sibling as part of the TD environment will provide further understanding of the family role in TD (cf. Taylor & Collins, 2015). With FST describing subsystem boundaries as dynamic on a continuum from enmeshed (i.e., a closed relationship) to

permeable (i.e., an open relationship; Minuchin, 1974), the sibling relationship is likely to vary over time (Taylor & Collins, 2015). Such nonlinearity is similar to contemporary models of TD (e.g., Bailey et al., 2010), thus indicating a crucial requirement for long-term consideration to better understand this variation. Collins and MacNamara's (2012) "rocky road" is an example of this nonlinear journey, which portrays the ups and downs experienced on the way to achieving elite status. Indeed, offering challenge is seen as essential, and calls into question traditional TD pathways that seek to create a smooth route to elite sporting success. Notably, previous studies suggest that siblings can have a multifactorial impact on this nonlinear pathway, specifically, through biological, psychological, and sociological interactions (cf. Blazo, Czech, Carson, & Dees, 2014; Côté, 1999; Davis & Meyer, 2008; Hopwood, Farrow, MacMahon, & Baker, 2015; Trussell, 2014). The integration of these three interactive domains reflect the biopsychosocial nature of development. Since the biopsychosocial model is relatively new to the sporting context (Bailey et al., 2010) it would be meaningful to further explore how such a pervasive relationship, presented against a backdrop of FST, impacts the development of talented athletes.

Recently, there have been numerous calls to understand TD pathways through modification of the methodology employed. Buekers, Borry, and Rowe (2015) stress the importance of longitudinal design to explore the dynamic and interactive nature of the broad TD environment. They further suggest that this contradicts the simple linearity of talent prediction methods such as a prediction curve; which can be unhelpful due to the multifaceted nature of performance development. Likewise, Till, Cobley, O' Hara, Cooke, and Chapman (2014)'s suggestion to measure longitudinal progression can serve to enhance the coaching environment *and* realize the need for an *expertise* approach to coach decision making (Collins, Burke, Martindale, & Cruickshank, 2015). In contrast, many previous cross-sectional studies have directly compared experts with novices (e.g., Beilock & Carr, 2001).

As such, an understanding of the pathway(s) required to achieve expertise are less exposed within data (notwithstanding criticisms over whether such experimental studies actually represent a true depiction of performance; e.g., Christensen, Sutton, & McIlwain, 2016). From an applied perspective, this information would be essential for coaches and practitioners working within development sport. Of course, a major consideration of longitudinal research is the time required. With many studies having sought understanding using short-term group comparisons, such testing detracts from the importance of an individual's perspective of the TD experience.

Interestingly, of the limited studies that have addressed the sibling dynamic in elite sport (cf. Blazo et al., 2014; Côté, 1999; Davis & Meyer, 2008; Hopwood et al., 2015) none focused on families with two athletes striving for elite status, instead examining a mix of sibling dyads (i.e., elite, semi-elite, non-elite). While this research provides valuable insight into sibling relationships within sport, study is limited in providing a full understanding of how different sibling dyads may act to support and/or disrupt progress along the pathway. Importantly, the literature distinguishes between participants on an Elite Referenced Excellence pathway (i.e., where achievement is measured against others with the goal to win at the highest level) versus a Personal Referenced Excellence pathway (i.e., where achievement is personally referenced, for example, completing an ironman event or lowering your handicap in golf; Collins et al., 2012). As Blazo and Smith (2017, p. 12) outline, "there is a lack of consistent connection to developmental outcomes such as talent development", and that if we are to be able to better educate coaches, parents, and athletes we need to further understand the positive and negative influences siblings may have on sports development (Davis & Meyer, 2008). Accordingly, it was appropriate at this stage to investigate semi-elites' (cf. Swann, Moran, & Piggott, 2015) interaction with their siblings while on an ERE pathway. Therefore, a 1 year longitudinal study was conducted to examine the impact of

siblings on TD where both are prevalent within the talent pathway. Interviews were conducted with siblings and parents with the aim of further enhancing our knowledge of the impact of this subsystem on the development process.

Method

Due to the study's subjective nature (i.e., focusing on experiences as reported by the participants; May, 2011), a constructivist epistemology was adopted with the intention of developing an understanding of the lived experience; therefore, allowing the identification of themes within each family system. As Jonassen (1991, p. 5) highlights, there is not one knowable truth and "knowledge is a process of actively interpreting and constructing individual knowledge representations." Specifically, TD was examined by collecting data from a variety of family members—the siblings themselves and their parent(s)—to ensure a multifaceted understanding (Yin, 2014). Of course, talent pathways are many and varied, with each sport having a system that, ideally, caters for the individual circumstances of the participants; in short, creating a very complex and dynamic environment for coaches to navigate. Accordingly, for the present investigation, a single case study (i.e., data were collected from one soccer academy within the UK) with embedded units (i.e., the families) was chosen as the most appropriate method for longitudinal tracking. This approach is useful because it allows analysis within and across individual units (cf. Baxter & Jack, 2008). Soccer was chosen for this first investigation as the most common, early starting and well-resourced pathway currently in existence in the UK. Finally, we deliberately chose a high status academy program, as identified by the Premier League's own system of evaluation.

Participants

Four families, each consisting of a sibling dyad and at least one parent depending on availability, were purposefully sampled to facilitate comparisons across the embedded units within the case study. Siblings all played in the same Premier League soccer academy and

represented the club at a range of age groups from U8's to U14's (Table 1). For this initial investigation, reflecting the challenges surrounding participant recruitment identified by Blazo and Smith (2017) and as stated above, soccer was chosen because of its high prevalence as a sport within TD research and due to the advantages associated with high participation rates. Ethical approval was obtained through the university's ethics committee and information sheets (for parents) and booklets (for youths) were provided. On receipt, and consideration, of these, signed informed consent was provided by parents and verbal assent by youths prior to data collection.

****Table 1 near here****

Procedure

Bi-monthly prolonged case study semi-structured interviews (every 2 months; cf. Baxter & Jack, 2008) over a period of 1 year were held with players to explore experiences, emotions, and behaviors during the TD process, alongside the parents perceptions of these. This enabled the triangulation of sources contributing towards the generation of a rich, robust, and comprehensive account of the relationship (Baxter & Jack, 2008). The study length was chosen to examine possible mechanisms for TD during preseason, in-season, and postseason; paying attention to the types of change that might occur within the sibling relationship (Saldaña, 2003) during a full cycle of an age group.

Joint interviews took place (siblings together/parents together, where both were involved) permitting for the development of a comprehensive data set. The motivation behind joint interviews was to establish rapport with the interviewees, build confidence, and especially concerning the siblings (considering their young age) to elicit greater discussion of events. Such an approach also enables the researcher to obtain two versions of events which may or may not provide a coherent account (Arksey & Knight, 1999). Data from each sitting were then used to inform the pairs' subsequent interview (Yin, 2014). Guarding against the

limitations of joint interviews, particularly the potential dominance of one interviewee over another, the researcher asked questions directly to both participants to encourage two accounts of the phenomenon (Arksey & Knight, 1999). In total, 21 interviews took place with parents ($M_{duration}$ = 28 minutes) and 23 interviews with siblings ($M_{duration}$ = 17 minutes). This approach directly focused on the sibling impact, as well as providing a holistic perspective toward the perceptions, attitudes, and meanings of the lived experience (Yin, 2014). Discussions were wide ranging, questions were based around two levels in order to allow the stream of questions to appear fluid rather than rigid (Rubin & Rubin, 2012). Level 1 questions were "friendly" and "nonthreatening" that engaged with the interviewee in a more relaxed manner (e.g., So who is your favorite player?; Yin, 2014), whilst Level 2 questions were focused on the needs of the line of inquiry for this study (e.g., Do you talk about what you are going to do?).

Data Analysis

Interviews were transcribed verbatim prior to conducting a thematic analysis (Braun & Clarke, 2006). Transcripts for parents and siblings within each family were converged for improved understanding (Baxter & Jack, 2008). Inductive analysis consisted of six stages using a qualitative software package (QSR NVIVO 10). Familiarization took place by the researcher immersing themselves in, and becoming familiar with, the content through reading and re-reading the data. Descriptive coding then took place to assign initial raw data codes, before searching for subthemes through examination of these codes based on patterns of meaning. Next, subthemes were reviewed to determine an accurate picture of these data, and one that illuminates the impact of siblings on TD. Subthemes were then grouped into distinct overarching themes with informative names that represent the impact of the sibling relationship, before contextualizing the analysis in relation to existing TD literature (King & Horrocks, 2010). To address data trustworthiness and the possibility of misrepresenting data

codes, peer debriefing took place with a second researcher. In the case of a dispute (< 5% of cases), alternative interpretations were presented until a plausible explanation was agreed upon (Sparkes, 1998).

Results

Data analysis revealed a combination of novel and replicated findings from other empirical studies. Novel findings comprise of skill development (subthemes; mentoring, co-operation, and challenge) and communication (instruction and discussion). Replicated findings (see Table 2) from other empirical studies are; interactional context (play and practice), emotional interpersonal skills (closeness and support), rivalry (performance and affective response), resilience (development and test), and types of separation (academy, school and self-initiated). As such, we present below the former as important characteristics through use of the emergent themes across the longitudinal period. First, a detailed account of newly emergent themes are presented (i.e., skill development and communication). Second, the temporal nature of the sibling subsystem highlights the changes within themes across the 1 year study; thus providing insight into the varying nature of the relationship. Third, a presentation of the differences across the sibling subsystems reveal the variability of the interactions across the dyads.

****Table 2 near here****

Extended Relationship Dynamics

Taylor et al.'s (2017) initial exploration of the sibling subsystem uncovered the theme of co-operation that was further represented by two subthemes; physical and verbal co-operation. The current study's findings, however, suggests a need for more refined consideration. With this in mind, we present the theme skill development as an expansion of the subtheme physical co-operation, and the theme communication as an expansion of the subtheme verbal co-operation (See Table 3).

****Table 3 near here****

Skill development. Skill development was divided into three sub-themes; *mentoring*, *co-operation*, and *challenge*. Three families highlighted occasions where they felt mentoring took place within the soccer context, usually with the older sibling as mentor and the younger as mentee. For example, in Family 3 the older sibling described: "Sometimes I teach her some techniques, like how to score a goal, and she practices how to score a goal." The younger sibling confirmed that she would learn from observing the older sibling: "I see him doing some tricks and goals," and "he shows me new skills." In addition, the mother observed that the older sibling would often encourage practice:

> She came to him and said 'can you show me this trick,' and she said it looked so difficult, so he started to show her the steps, but she said it was boring. He said 'yes it is, but you have to do this before you can complete the skill.'

Similarly, the older sibling within Family 4 described: "Usually he'll do some practice and then once I can do it I'll try to coach him how to do it." This was then reiterated by the younger sibling: "Recently we went out together to the park and he taught me some skills that he's learnt and we did serious training instead of kicking it."

All families discussed co-operation, with the older sibling in Family 2 highlighting an example of how this supports skill development:

> We have one ball and one guy tries to do the skill, and if he does it the other guy tries to copy him. The one that can do it gives them tips you see. So if he needs to lean forward and stuff like that. That way it makes it easier for the other.

This was reinforced by the mother's assertion that "they have definitely learnt from each other." In Family 1 the younger sibling provided some examples of how their co-operation works: "We take it in turns, and do it together." These sibling's co-operation also extended beyond the physical act of playing soccer, they often used external sources together, such as

the internet to "find clips of people doing skills and then we show each other." The older sibling in Family 3 provided an example of how co-operation was reciprocally beneficial:

> With her, I can practice my skills and it helps me as well. When I go over it with her, it helps me shape what I have to do in a game situation. When I ask her to do it faster, I have to do it faster.

The younger sibling elaborated on this by highlighting that "sometimes he wants me to pick any skills I want to do, and sometimes he picks."

The final sub-theme, challenge, also acknowledged by all families, reflected a move towards competitive preparation through planning and goal setting. This was summarized by the mother in Family 3 who identified that it was part of the sibling relationship:

> It is more fun if there is actually a target and it is more competitive. For example, with the trampoline they start with the ball, and then one changes it if it touches the ground five times, and then it starts getting competitive and more interesting.

The younger sibling added to this, highlighting a competitive element: "We sometimes set goals and then we just score each other, and then we try and challenge each other." They also liked to try new things together, with the older sibling remembering "someone scored a bicycle kick [on TV], and we went outside and tried to do a bicycle kick." Likewise, both siblings in Family 4 talked about how they set each other targets to achieve with the older sibling saying "we set targets before we go to the park … we'll say three targets."

Communication. All families referred to the communication that occurred between siblings. This was subdivided into *instruction* and *discussion*. Instruction included a range of data codes which included both positive and negative comments. For example, in Family 4 the mother commented on the negativity of the older sibling:

> Sometimes he is hard on him; 'you can't shoot,' instead of him saying to him 'shoot like that,' I say that to him. So I say to him don't say the negative things to him, tell him how to do it.

There was also mention of how to improve, with the older sibling providing an example:

> I will suggest things to him, like 'maybe you could do this or this' … sometimes it's a bit hard to get instructions through to him. Once you've told him then he'll do it, but he wouldn't admit that he doesn't do it.

In Family 1 the older sibling added to this variation: "It depends if she can do it or not. If she can't do it then I'll tell her, but she might get annoyed." Further observations from the mother in Family 3 highlighted the positive aspects of this instruction:

> I think it is more from him [older sibling] to her [younger sibling]. He said 'when I was your age I faced the same situation and you could do it like this or that or try this way.' From her to him it is more 'let's do this, you will be fine,' more than advice.

The older sibling talked about the feedback they would often give the younger sibling: "I praise her, and tell her how she has improved and how well she has done in the game." Finally, the mother of Family 4 identified the general trend in the sibling relationship suggesting they would "point out something that went wrong."

Discussion between the siblings was most commonly associated with soccer. For example, the mother in Family 2 observed:

> There is definitely football talk … They'll always discuss their matches. They love to hear how they went, you know, who did they play, how did it go. They'll re-enact their goals for each other … I did this skill and things, and that sort of discussion goes on.

This was supported by the older sibling who highlighted that discussion helps them revisit aspects of their performance, as they "talk about matches we played at the weekend, and

we'll see what we did and skills we did." When elaborating on specific scenarios the mother in Family 1 suggested that "they started doing some videos and they talk about it … mostly about football or things that they watch." The older sibling identified "what stands out in the training session that happened," and the younger sibling acknowledged "what was fun about training" as key topics for discussion. Family 3 identified that much of this discussion would take place during activity with the older sibling suggesting that there is "lots of chatting when we play football." The mother provided further clarification of this communication by sharing that they felt it would sometimes be time restricted: "Even if it is only 5 or 10 minutes they are talking so they are up-to-date." The father in Family 4 reflected on the scope of the sibling's discussion: "They talk about the game, they replay on everything."

Temporal Nature of the Sibling Subsystem

As a result of the longitudinal approach taken, this study shows the temporal characteristic of the themes (Tables 2 and 3) identified, with examples now provided.

When considering the *interactional context,* the younger sibling in Family 1 mentioned the seasonal element when trying to play, suggesting "when it is the summer we always went outside and played football, so now it's more dark we can't play as much." This was also evident when practice was discussed with the mother suggesting that over the Christmas break "they trained most of the time in the garden together," and that the weather can be a factor: "If the weather is ok then they play outside, practising most of the time, shooting skills and things like that." Family 4 also provided evidence of the variation that occurred across the year. The mother reported that they were now training more together: "They recently bought some training stuff, and [older sibling] said they are going to train together and stuff, and they train more together." The father added to this through acknowledgment of how this changed their interactions:

> Yes, they work on specific stuff as well, they bought training aids like cones and stuff like that. [Older sibling] fancies himself as a bit of a coach, so they train on specific things now. Before it was just kick, but now they work on specific stuff.

Evidence of variation within the theme *emotional interpersonal skills* was also apparent across the year. For instance, the mother in Family 1 highlighted that their closeness was not always consistent: "Sometimes they cannot live without each other and with each other. They get annoyed with each other, fight for 5 minutes and then they want to play." Similarly, Family 2 recognized that the sibling closeness would sometimes falter and arguments would occur. This was summed up by the older siblings comment that "it's petty things … just had a bit too much time together." In contrast, the mother talked about a period in the year when the younger sibling was in hospital and their closeness became magnified:

> [Older sibling] was there with us when we were going through this. The hospital really commented on how [he] was with [him], and what a good brother he was. They could see how close they were … So [he] would sit by [his] side, and when he would come round a little bit he would show him videos of football matches.

The siblings in Family 1 also acknowledged this temporal variation, with the older sibling describing a change that would affect the opportunity to support the younger sibling's *skill development*:

> I won't have as much time to help and train with her as I will have summer camp, and that's 5 hours for 3 weeks on Tuesday, Wednesday, and Thursday. So I will have Friday, Saturday, Sunday, and Monday to train with her over the summer.

Variability of co-operation was also described by Family 4, with the younger sibling outlining a potential response if they couldn't agree: "We would try something we can both try to do, but if that doesn't work we might take out two balls."

When discussing the sibling's *communication*, the mother in Family 1 suggested that it can depend on what happens for discussion to occur: "If it went good for them they are ready to talk about it. If it didn't then they don't." The mother also acknowledged a change in what they discussed, revealing that "they started doing some videos and they talk about it." When asked if they listened to instruction from the older sibling the younger sibling responded with "sometimes," with the older sibling adding, "sometimes she listens, sometimes she ignores me." Family 2 revealed that instruction was not always well received as the older sibling commented on the younger sibling taking advice: "Yes he does, but he can get frustrated sometimes." Discussion within the family altered when the older sibling moved away from the family home towards the end of the year. When asked about phone conversations, the younger sibling shared that they "talk about loads of different things … like the latest football news, and training and stuff." The older sibling also confirmed that during this period they "talk about how we are getting on," and that this would occur "every few days."

When considering the affective response *rivalry* had on the siblings in Family 2, frustration and anger would occasionally surface. The mother suggested that "now and again they will lose their temper, if he [younger brother] loses he's not happy," and the older sibling also highlighted the impact it had on the younger sibling: "It can be the other way around, he gets frustrated." However, he did also justify that it was frustrating for him too: "Sometimes when you can't do it, and you get frustrated. You just want to focus on your own things." Family 1 also discussed the variation of the affective response with the mother suggesting "he will sometimes get jealous of her getting things that he might not." When talking about their coaching the mother outlined that the younger sibling sometimes got jealous: "She spoke to me and said that he is getting more challenge and harder things to do, and she was getting easier things." The mother also identified that if the younger sibling

achieves something ahead of the older sibling "then he makes excuses why he can't do it because he's got the wrong boots on or something."

The variation in *resilience* was also discussed. The mother in Family 3 commented on the changes that occurred:

> I think the last month he's taking it seriously so when he can score then he scores, and then this is when she probably tries to push him and try to score as well. I think that has changed, it's more serious now.

The younger sibling reinforced this by sharing that "he tries to go against me and I can push him into the sofa to stop him scoring." When considering how the siblings in Family 1 test resilience, the father suggested this sometimes went too far: "Sometimes he pushes her too strongly or she pushes him too strongly." However, the mother remarked that perhaps such interaction benefitted the younger sibling: "By playing, she is really good, she is really strong when playing so she is not afraid to play with them." With this in mind the older sibling provided insight into how this may look: "So sometimes I will be more match realistic in tackles and stuff like that, and maybe mistimed challenges, and see how she copes."

The *type of separation* experienced by Family 4 changed towards the end of the year when the older sibling got released by the club, with the father describing the impact this has had: "So [older sibling] has been going up and down in many different places [looking for a new club], so it is quite different for us." This lead to the older sibling moving to a club away from home: "I've moved up here … a month, so moved up in February." This resulted in the younger sibling practicing "outside a lot less." When considering the impact of school on separation the finishing times of their respective schools appeared as a barrier to interaction in Family 3. The older sibling acknowledged this through the following: "I finished school before her so I did two weeks [of training] alone."

Contrasts Across Families

These longitudinal data highlight the subtle, but demonstrable, differences in dynamics between sibling dyads. We are aware that Krane, Andersen, and Strean (1997) explicitly emphasized that quantity of raw data codes (as reflecting a positivist perspective) does not necessarily indicate the importance placed on them by the family, and therefore, such suggestions deviate from the qualitative nature of this paper. However, through presenting exemplar quotations from the participants themselves, alongside Figure 1, we emphasize how nonpositivistic interventions must be. In other words, the presentation of data code frequency is in fact intended to criticize the positivist perspective. Therefore, we portray evidence of an important practical implication for the need to avoid generalized packages for treatment of families within TD. In order to provide concise accounts of the differences we have chosen to only present examples from those themes, that data suggests, characterize each family through the high number of raw data codes per theme.

****Figure 1 near here****

When asked to summarize how participants believed siblings impacted on *their* soccer development, there was a clear link between the themes they identified and the frequency of raw data codes depicted in Figure 1. Family 1 reported a high frequency of codes with regards to skill development and this was summarized by the older sibling's response to the question: "I wouldn't have anyone to train with and wouldn't be able to learn from what she does and her learn from me". In contrast, Family 2 referred to emotional interpersonal skills throughout the study, with the parent providing the following summary: "What they have created with each other is safe and secure, friendly, happy, positive, and excludes that more negative stuff. For me that is how they help each other in football. Probably more than the practical stuff". Further evidence of these subtle differences was summarized by the older sibling in Family 3, who identified the importance of their sibling supporting their skill development: "With her I can practice my skills and it helps me as well. When I go over it

with her it helps me shape what I have to do in a game situation". Finally, support for these contrasts was underpinned within Family 4 by the older sibling's overview of their relationship strongly emphasizing rivalry: "Because we are brothers so we are competitive. It's like Messi and Ronaldo, it's that competition, we push each other to do better". Figure 1 also provides further evidence of the variation of theme use across the year.

Discussion

This study aimed to explore the potential mechanisms through which siblings impact on TD in sport. Identified themes support evidence for the sibling relationship's impact on TD (see Table 2), namely, through the interactional context, emotional interpersonal skills, rivalry, resilience and separation (Blazo et al., 2014; Côté, 1999; Davis & Meyer, 2008; Hopwood et al., 2015; Taylor et al., 2017; Trussell, 2014).

Furthermore, this study has provided greater insight around the theme of co-operation (see Table 3), previously identified by Taylor et al. (2017) through expanding the initial sub-themes of physical and verbal co-operation through the exploration of two new overarching themes; skill development and communication (cf. Taylor et al., 2017). Indeed, co-operation was used to impact on skill development outcomes and the communication that occurs between siblings through a variety of formats. However, of most interest is the further, and more detailed, exposure of the subsystem's changeable nature. When considering the theme of separation, alongside the variation within the remaining themes, it is apparent that the permeability of the sibling subsystem boundaries further supports the dynamism of this relationship. It is evident through this study that each subsystem constantly moves along the continuum of enmeshment to permeability (FST) in a bidirectional manner dependent on the time of year and the environment. For example, the boundaries of the sibling subsystem in Family 2 became highly permeable when the older sibling moved out of the family home as the younger sibling utilized the parent–child subsystem, as well as peer relations outside of

the family system to combat this. However, during the summer the mother commented on how the boundaries became highly enmeshed as they were back together and had little interest for people outside of the subsystem (cf. Taylor & Collins, 2015). As such, any approach to using this relationship would require an understanding of the prominence and relevance of the themes identified through this study and others (Blazo et al., 2014; Côté, 1999; Davis & Meyer, 2008; Taylor et al., 2017; Trussell, 2014).

Through a longitudinal approach this study has illuminated the ongoing variation across the potential mechanisms identified within the relationship, such as time of year (e.g., summer allowed more outdoor activity) and soccer progression (e.g., siblings moving away from the family home for sustained periods). The iterative nature of longitudinal qualitative research supported the nonlinear nature of the sibling subsystem as it allowed for the identification of progressive change within each family system; some acute (e.g., rivalry – Family 4) and others chronic (e.g., regularity of interaction – Family 3). Furthermore, such a period allowed for an enhanced understanding of phenomena, such as the sibling subsystem and TD environment, that evolves over time. In other words, data were better able to be contextualized along the pathway. Therefore, such an approach has been critical in understanding what happens, when it happens, and how it happens (Carduff, Murray, & Kendall, 2015). With this in mind, it is recommended that further research across the entire TD domain considers the application of a longitudinal approach in order to maximize opportunity for the exploration of such a complex and multi-faceted domain and to best interpret intervention effects (Stenling, Ivarsson, & Lindwall, 2017).

Collins et al. (2012) identified the importance of a biopsychosocial perspective on TD, with the view that unidisciplinary models are insufficient in the face of such a complex domain (cf. Burwitz, Moore, & Wilkinson, 1994). In fact, Abbott, Button, Pepping, and Collins (2005) concluded that those who fail to recognize the multifaceted, and highly

individualized, nature of TD by not focusing on all three domains, in particular their interactions, are in danger of providing a less than optimal approach. Accordingly, we suggest that the sibling relationship needs to be recognized not only for its obvious social contribution to the TD pathway, but can, if optimized, provide an additive biopsychosocial impact for talented athletes, with emerging themes reflecting such diversity. For example, reflective discussion between siblings around what happened, why and how it could be improved (psychological), re-enacting the skill as it would be intended to in the future (biological), followed by reinforcement and support from the sibling to ensure that it takes place (social). Moreover, we feel the nonlinear interactions between such factors during TD are further evidenced through these findings, with changes in regularity and emphasis of potential mechanisms apparent across the year (e.g., identification of self-initiated separation between siblings). As such, sibling relationships in this study reflect the nonlinear nature of the "rocky road" pathway as advocated by Collins and MacNamara (2012). Siblings had to negotiate a pathway around challenges (e.g., reacting to their sibling self-initiated separation, not having the freedom of outdoor space, or increased physicality) as a means to facilitate their participation.

Ultimately, this provides insight into the complexity for coaches, parents and organizations involved in TD. As many have stated across a range of human performance and developmental processes, 'one size does not fit all' (e.g., Scott & Einstein, 2001) illuminating the individualized and complex relationships that can occur within the family during TD. Therefore, when utilizing the potential contribution the sibling subsystem can make to TD, we recommend favoring an expertise approach, rather than a competence approach, in order to maximize possible impact (Collins et al., 2015). Consequently, the significance of a coach's professional judgement and decision making (PJDM) within the practical domain cannot be understated, as it would be illogical to always provide an "if X

then Y" support system as a solution for a potentially influential aspect of the complex TD environment (Martindale & Collins, 2005). Such suggestions are supported by the variation of themes within, and across, sibling dyads within this study, therefore highlighting the need to get to know individual dyads. Therefore, coaches are advised to make a series of decisions in relation to finding or designing, and evaluating suitable courses of action (Simon, 1986). One course of action might center around conversations with parents, since this study has highlighted the usefulness of parent observations when reviewing the sibling subsystem across the year from within the family system.

Despite the insights that have been gained from this study it is important to recognize that it was not without its limitations. Conducting such a longitudinal study over 1 year allowed us to examine different phases of the soccer season across a recognized time frame within TD. However, because TD takes place over a much longer period of time, examining the complexity and changing nature of the sibling subsystem over a longer period (e.g., specialization and investment stages; Côté, 1999) would further illuminate the role of the relationship. Furthermore, tracking of this nature should extend until a meaningful age of participation (e.g., attainment of premiership/elite status) or until drop-out from a performance focused pathway. In other words, longitudinal research should be able to distinguish those who have made it and those who have not. Purposefully exploring a range of sports, including team and individual disciplines would also help build a more comprehensive understanding of the subsystems role in TD.

Conclusion

This study has further extended the limited sibling literature within the TD domain, through the exploration of sibling dyads where both are talented athletes. The themes of interactional context, emotional interpersonal skills, rivalry, resilience and separation all support previous research (Blazo et al., 2014; Côté, 1999; Davis & Meyer, 2008; Hopwood et

al., 2015; Taylor et al., 2017; Trussell, 2014). We feel this study expands on initial research by Taylor et al. (2017) through the replacement of the theme co-operation, with the more specific themes of skill development and communication as potential mechanisms that facilitate TD. The longitudinal approach has advanced our understanding around the nonlinear and complex nature of the subsystem by exposing the variation of particular themes throughout the year, alongside the variation across the sibling dyads.

Overall, this study has illuminated the biopsychosocial impact the subsystem can have on TD, provided examples of FST in action (through shifting subsystem boundaries), and provided significant evidence surrounding the highly complex and differentiated appearance of the subsystem across families. Finally, we suggest further theoretical exploration of the sibling subsystem, taking into consideration talented and non-talented siblings and sociocultural family variables, alongside greater consideration of the practical implications of including the sibling relationship in the TD environment.

References

Abbott, A., Button, C., Pepping, G. J., & Collins, D. (2005). Unnatural selection: Talent identification and development in sport. *Nonlinear Dynamics, Psychology, and Life Sciences, 9,* 61–88.

Arksey, H., & Knight, P. Y. (1999). *Interviewing for social scientists: An introductory resource with examples*. London: Sage.

Bailey, R., Collins, D., Ford, P. A., Macnamara, Á., Toms, M. R., & Pearce, G. (2010). Participant development in sport: An academic review. Retrieved from https://www.sportscoachuk.org/sites/default/files/Participant-Development-Lit-Review.pdf

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report, 13,* 544–559.

Beilock, S. L., & Carr, T. H. (2001). On the fragility of skilled performance: What governs choking under pressure? *Journal of Experimental Psychology: General, 130,* 701–725.

Blazo, J. A., Czech, D. R., Carson, S., & Dees, W. (2014). A qualitative investigation of the sibling sport achievement experience. *The Sport Psychologist, 28,* 36–47.

Blazo, J. A., & Smith, A. L. (2017). A systematic review of siblings and physical activity experiences. *International Review of Sport and Exercise Psychology*, 1-38. doi:10.1080/1750984X.2016.1229355

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77–101.

Buekers, M., Borry, P., & Rowe, P. (2015). Talent in sports. Some reflections about the search for future champions. *Movement & Sports Sciences, 88,* 3–12.

Burwitz, L., Moore, P. M., & Wilkinson, D. M. (1994). Future directions for performance-related sports science research: An interdisciplinary approach. *Journal of Sports Sciences, 12*, 93–109. doi:10.1080/02640419408732159

Carduff, E., Murray, S. A., & Kendall, M. (2015). Methodological developments in qualitative longitudinal research: The advantages and challenges of regular telephone contact with participants in a qualitative longitudinal interview study. *BMC Research Notes, 8*, 142–152. doi:10.1186/s13104-015-1107-y

Christensen, W., Sutton, J., & McIlwain, D. J. F. (2016). Cognition in skilled action: Meshed control and the varieties of skill experience. *Mind & Language, 31*, 37–66. doi:10.1111/mila.12094

Collins, D., Bailey, R., Ford, P. A., MacNamara, Á., Toms, M., & Pearce, G. (2012). Three worlds: New directions in participant development in sport and physical activity. *Sport, Education and Society, 17*, 225–243. doi:10.1080/13573322.2011.607951

Collins, D., Burke, V., Martindale, A., & Cruickshank, A. (2015). The illusion of competency versus the desirability of expertise: Seeking a common standard for support professions in sport. *Sports Medicine, 45*, 1–7. doi:10.1007/s40279-014-0251-1

Collins, D., & MacNamara, A. (2012). The rocky road to the top: Why talent needs trauma. *Sports Medicine, 42*, 907–914. doi:10.2165/11635140-000000000-00000

Conger, K. J., & Kramer, L. (2010). Introduction to the special section: Perspectives on sibling relationships: Advancing child development research. *Child Development Perspectives, 4*, 69–71. doi:10.1111/j.1750-8606.2010.00120.x

Côté, J. (1999). The influence of the family in the development of talent in sport. *The Sport Psychologist, 13*, 395–417.

Davis, N. W., & Meyer, B. B. (2008). When sibling becomes competitor: A qualitative investigation of same-sex sibling competition in elite sport. *Journal of Applied Sport Psychology, 20,* 220–235. doi:10.1080/10413200701864817

Furman, W., & Buhrmester, D. (1985). Children's perceptions of the personal relationships in their social networks. *Developmental Psychology, 21,* 1016–1024. doi:10.1037/0012-1649.21.6.1016

Hopwood, M. J., Farrow, D., MacMahon, C., & Baker, J. (2015). Sibling dynamics and sport expertise. *Scandinavian Journal of Medicine & Science in Sports, 25,* 724–733. doi:10.1111/sms.12387

Howe, N., & Recchia, H. (2014). Introduction to special issue on the sibling relationship as a context for learning and development. *Early Education and Development, 25*, 155–159.

Jonassen, D. H. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5-14. doi:10.1007/bf02296434

Jowett, S., & Timson-Katchis, M. (2005). Social networks in sport: Parental influence on the coach-athlete relationship. *The Sport Psychologist, 19,* 267–287. doi:10.1123/tsp.19.3.267

King, N., & Horrocks, C. (2010). *Interviews in qualitative research.* London: Sage Publications.

Martindale, A., & Collins, D. (2005). Professional judgement and decision making: The role of intention for impact. . *The Sport Psychologist, 19,* 303–317.

May, T. (2011). *Social research: Issues, methods and process*. Maidenhead: McGraw-Hill.

McHale, S. M., Updegraff, K. A., & Whiteman, S. D. (2012). Sibling relationships and influences in childhood and adolescence. *Journal of Marriage and Family, 74*, 913–930. doi:10.1111/j.1741-3737.2012.01011.x

Minuchin, S. (1974). *Families and family therapy*. Cambridge, MA: Harvard University Press.

Rubin, H., & Rubin, I. (2012). *Qualitative interviewing: The art of hearing data* (3rd ed.). Thousand Oaks, CA: Sage.

Saldaña, J. (2003). *Longitudinal qualitative research: Analyzing change through time*. California: Altamira Press.

Scott, S. G., & Einstein, W. O. (2001). Strategic performance appraisal in team-based organizations: One size does not fit all. *The Academy of Management Executive, 15*, 107–116. doi:10.5465/ame.2001.4614990

Simon, H. (1986). *Decision making and problem solving. Research briefings 1986: Report of the research briefing panel on decision making and problem solving.* Retrieved from Washington, DC:

Sparkes, A. (1998). Validity in qualitative inquiry and problems of criteria: Implications for sport psychology. *The Sport Psychologist, 12*, 363–386.

Stenling, A., Ivarsson, A., & Lindwall, M. (2017). The only constant is change: Analysing and understanding change in sport and exercise psychology research. *International Review of Sport and Exercise Psychology, 10*, 230–251. doi:10.1080/1750984X.2016.1216150

Swann, C., Moran, A., & Piggott, D. (2015). Defining elite athletes: Issues in the study of expert performance in sport psychology. *Psychology of Sport and Exercise, 16*, 3-14. doi:http://dx.doi.org/10.1016/j.psychsport.2014.07.004

Taylor, R. D., & Collins, D. (2015). Reviewing the family as a stakeholder in talent development: Is it undervalued? *Quest, 67,* 330–343. doi:10.1080/00336297.2015.1050747

Taylor, R. D., Collins, D., & Carson, H. J. (2017). Sibling interaction as a facilitator for talent development in sport. *International Journal of Sports Science & Coaching, 12*(2), 219-230. doi:doi:10.1177/1747954117694926

Till, K., Cobley, S., O' Hara, J., Cooke, C., & Chapman, C. (2014). Considering maturation status and relative age in the longitudinal evaluation of junior rugby league players. *Scandinavian Journal of Medicine & Science in Sports, 24*(3), 569-576. doi:10.1111/sms.12033

Trussell, D. (2014). Contradictory aspects of organized youth sport: Challenging and fostering sibling relationships and participation experiences. *Youth & Society, 46,* 801–818. doi:10.1177/0044118X12453058

Volling, B. (2003). Sibling relationships. In M. Bornstein, L. Davidson, C. Keyes, & K. Moore (Eds.), *Well-being: Positive development across the life course* (pp. 205–220). Mahwah, NJ: Lawrence Erlbaum Associates.

Yin, R. (2014). *Case study research design and methods* (5th ed.). Thousand Oaks, CA: Sage.

Table 1. *Participant characteristics*

	Family Members	**Gender**	**Starting Age**
Family 1	Mother		
	Father		
	Sibling 1	Male	11
	Sibling 2	Female	9
Family 2	Mother		
	Sibling 1	Male	14
	Sibling 2	Male	12
Family 3	Mother		
	Sibling 1	Male	12
	Sibling 2	Female	9
Family 4	Mother		
	Father		
	Sibling 1	Male	13
	Sibling 2	Male	10

Table 2. *Potential mechanisms that support TD – support for previous findings*

Overarching theme	**Sub-theme**	**Exemplar raw data (F = Family)**
Interactional context	Play	"When it's the summer we always went outside and played football" (F3) "We play football in the house as well" (F2) "We usually play together; we go out to play football" (F3) "They spend more time just playing football, but they might also in the summer play other things" (F1) "If the weather is good they go outside and play football" (F4)
	Practice	"We both got goals, so we trained on tackling and tricks" (F3) "Practicing on our weaker foot and stuff like that" (F2) "Sometimes we go and do skills … or practice shooting, one of us goes in goal" (F1)
Emotional interpersonal skills	Closeness	"They are good friends, which means they like to spend time together" (F2) "They have the same interests and emotionally they are connected" (F3) "They are proud of each other" (F1)
	Support	"Watch all her games" (F1) "Sometimes I am tense and excited, I want to see him do well" (F2) "We encourage each other to do better because we are brothers." (F4)
Rivalry	Performance	"They are both very competitive you know, and it's all about winning" (F2) "We want to do better than the other in training" (F4) "He always says I cheat with the score" (F2)
	Affective response	"Now and again they will lose their temper, if he loses he's not happy" (F2) "Definitely benefits from the competitive aspect, drives him, he looks up to him" (F4)

Resilience	Development	"If we don't practice physicality she could probably get knocked off the ball easier" (F1) "You have to be harder with him, that's how he will improve. So he is more into pushing him, he wants to push [younger brother]" (F4) "I want her to learn how to lose as well, because you can't always win" (F3)
	Test	"I will be more match realistic … mistimed challenges, see how she copes" (F1) "Never seen him[older] give him[younger] any benefit" (F2) "If she failed then she is trying again and again" (F3)
Type of separation	Academy	"It is always when one is at home, the other is away. One has a tournament on a Saturday, one on a Sunday" (F2) "Half term, [older brother] is going to England camp" (F4) "It's a lot different without him, I really don't know what to say" (F4) "He is ready for his independence and wants to experience this, but that's going to be a big thing for [younger brother] with his brother moving out" (F2)
	School	"After school they don't have as much time, they get back ... it is dark" (F1) "We go to different parts of the school" (F1) "When we are inside we will be doing school stuff" (F3)
	Self-initiated	"Sometimes I will go out and train and she will just play on her own" (F3) "Sometimes when I get tired and he wants to talk to me about it, and I will not want to, so I will say to him you can tell me tomorrow or later" (F3) "I still go outside a lot with my mate … he will stay inside and play" (F4)

Table 3. *Potential mechanisms that support TD – newly emergent themes*

Overarching theme	**Sub-theme**	**Exemplar raw data (F = Family)**
Skill development	Mentoring	"Put your foot there and role the ball this way, and do this skill at this time" (F1) "He wants to help her improve and become the best she can do" (F3) "He asked me how to do this skill and I showed him, and he could do it after" (F2)
	Co-operation	"Like to bounce ideas off each other, and show each other different stuff" (F2) "They try to find games inside, so they play football inside. Not as much as the summer time, but they are always kicking the ball, playing tricks or skills. Even if it is only a balloon" (F3) "Otherwise I wouldn't be able to learn from what she does" (F1)
	Challenge	"Let's do it on the left leg so they need to work on the weaker foot" (F1) "They do influence each other's style as they are showing each other skills they could potentially do" (F2) "Skill challenges against each other" (F2) "Because of the goals we set each other when we practice them we get better at them. Maybe it is something we wouldn't normally do that we set each other, so we are out of our comfort zone" (F4)
Communication	Instruction	"Give them tips" (F2) "Sometimes it's good comments, sometimes it's ok, sometimes it's a bit bad" (F1) "He tells me how to improve and I would try that, and then I got it" (F3)
	Discussion	"There is definitely football talk … They'll always discuss their matches" (F2) "Talk about what we are doing, what we need to think of, what we need to do" (F4) "We just discuss it and things like that. For example, in the middle of the game if I call it at a point, she will say oh this this …we will chat about it afterwards as well, but sometimes we talk, sometimes it doesn't need to take talking" (F1) "We have a little break and we talk about things and we do reflections" (F3)

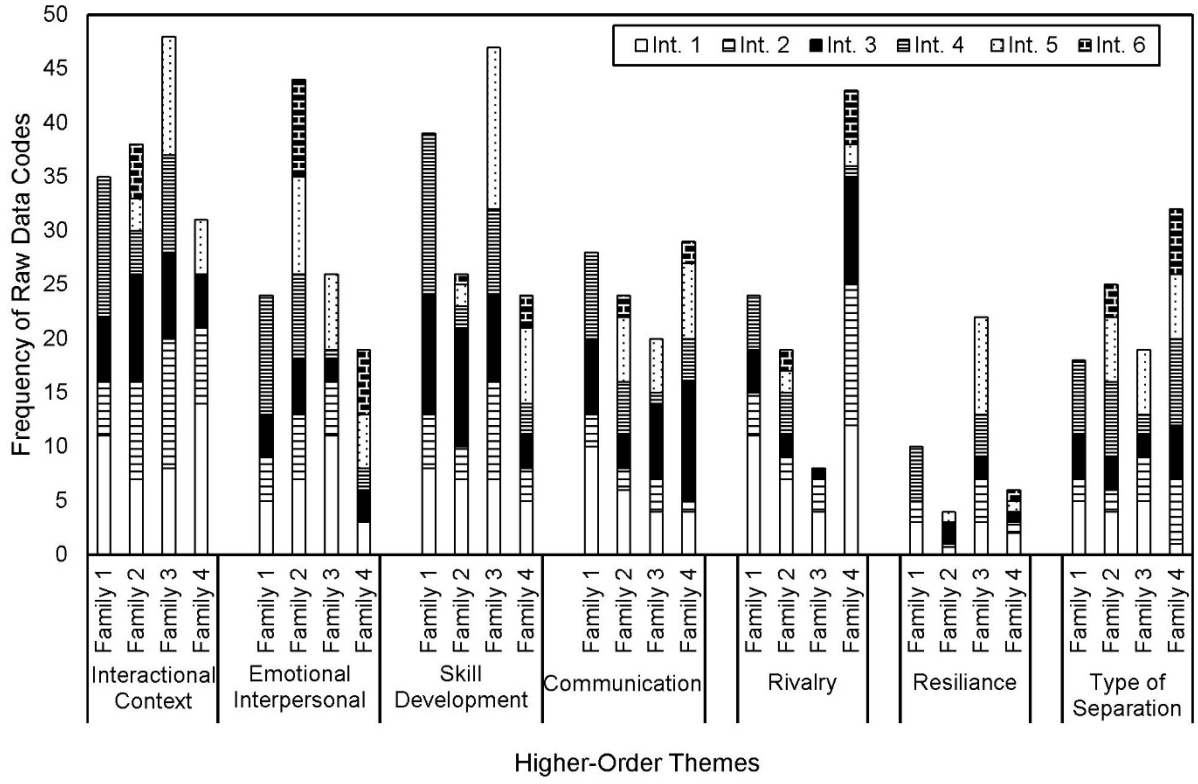
Int. 1
Int. 2
Int. 3
Int. 4
Int. 5
Int. 6
Frequency of Raw Data Codes
0
5
10
15
20
25
30
35
40
45
50
Family 1
Family 2
Family 3
Family 4
Interactional Context
Emotional Interpersonal
Skill Development
Communication
Rivalry
Resiliance
Type of Separation
Higher-Order Themes

Figure Caption

Figure 1. The use and importance of potential mechanisms – comparisons between families and across time